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Claims

[c1] 1.A bracing clip for use in resisting lateral forces, uplift forces, or both in light gauge steel framing members or wood structural framing members, the bracing clip comprising:

a first rectangular plate;

a second rectangular plate, with one edge abutting one edge of the first rectangular plate, the abutting plates forming a 90 degree angle and connected along the abutting edge, wherein the first and second plates each have a major interior surface and an exterior major surface and the angle formed by the interior major surfaces is 90 degrees and the angle formed by the exterior major surfaces is 270 degrees;

two first flanges formed from the first plate, each first flange having an edge extending along a respective edge of the first plate that is perpendicular to the abutting edge of the first and second plates, the first flanges at 90 degree angles to the first plate exterior major surface and away from the interior major surface;

two second flanges formed from the second plate, each second flange having an edge extending along a respective edge of the second plate that is perpendicular to the

abutting edge of the first and second plates, the second flanges at 90 degree angles to the second plate exterior major surface and away from the interior major surface; and

at least one bracket member plate having one edge fixedly attached to the interior major surface of the first plate and one edge fixedly attached to the interior major surface of the second plate.

[c2] 2.The bracing clip of claim 1, wherein there are two bracket member plates spaced in parallel relation.

[c3] 3.The bracing clip of claim 1, wherein the first and second plates are made from a unitary bent plate, and the bend is 90 degrees, forming the abutting edge.

[c4] 4.A bracing clip for use in resisting lateral forces, uplift forces, or both in light gauge steel framing members or wood structural framing members, the bracing clip comprising:

a first rectangular plate;

a second rectangular plate, with one edge abutting one edge of the first rectangular plate, the abutting plates forming a 90 degree angle and connected along the abutting edge, wherein the first and second plates each have a major interior surface and an exterior major surface and the angle formed by the interior major surfaces

in 90 degrees and the angle formed by the exterior major surfaces is 270 degrees;
two first flanges formed from the first plate, each first flange having an edge extending along a respective edge of the first plate that is perpendicular to the abutting edge of the first and second plates, the first flanges at 90 degree angles to the first plate exterior major surface and away from the interior major surface;
two second flanges formed from the second plate, each second flange having an edge extending along a respective edge of the second plate that is perpendicular to the abutting edge of the first and second plates, the second flanges at 90 degree angles to the second plate interior major surface and away from the exterior surface; and
at least one bracket member plate having one edge fixedly attached to the interior major surface of the first plate and one edge fixedly attached to the interior major surface of the second plate.

[c5] 5.A stud support clip for supporting two vertically aligned structural framing members made of light gauge steel or wood and allowing a diagonal tension strut to pass therebetween, the stud support clip comprising:
a vertical central web portion having an interior major surface, exterior major surface, and a top end and a bottom end;

two inclined portions extending away from the central web interior surface at an obtuse angle at each end of the web portion;

a vertical terminal portion extending vertically away from each inclined portion and having an interior major surface and an exterior major surface corresponding to those surfaces of the central web portion;

a first flange extending horizontally from a vertical edge of each terminal portion and forming approximately a 90 degree angle with the terminal portion interior major surface, and having an interior major surface and an exterior major surface; and

a second flange extending horizontally from the free vertical edge of each first flange and forming approximately a 90 degree angle with the first flange interior major surface,

wherein the stud support clip is adapted to receive a vertical structural member at each end and the diagonal tension strut between the vertical structural members.

[c6] 6.The stud support clip of claim 5, further comprising means for fastening the stud support clip to the vertical structural members and the diagonal tension strut.

[c7] 7.A stud support clip for supporting two vertically aligned structural framing members made of light gauge steel or wood and allowing a diagonal tension strut to

pass therebetween, the stud support clip comprising:
two opposing central vertical web portions each including an interior major surface, exterior major surface, and a top end and a bottom end;
two inclined portions extending away from each central web interior surface at an obtuse angle at each end of the respective central web portion; and
a rectangular sleeve extending from each of the inclined portions;
wherein each rectangular sleeve is adopted to receive a vertical structural member and the stud support clip is adapted to allow a diagonal tension strut to pass therethrough.

[c8] 8.The stud support clip of claim 7, further comprising means for fastening the stud support clip to the vertical structural members and the diagonal tension strut.

[c9] 9.A bracing apparatus for use in resisting lateral forces, uplift forces, or both in structural framing, the structural framing made of light gauge steel members, wood, or both, the structural framing comprising first and second vertical studs in spaced parallel relation, each having an upper end and a lower end, a horizontal plate across the top of the two vertical studs and fastened to the upper end of each stud, and a sill disposed along a base and fastened to the studs at the lower end of the studs, the

bracing apparatus comprising:
a head clip mounted to the horizontal plate and the upper end of the first vertical stud;
a sill clip mounted the sill and to the lower end of the second stud;
a tension strut of adjustable length; and
means for mounting the tension strut to the head clip and to the sill clip.

[c10] 10.The bracing apparatus of claim 9, wherein the tension strut comprises two reciprocally mounted structural sections and means for fixing the length of the strut, whereby the length of the strut may vary according to the distance between the head clip and the sill clip.

[c11] 11.The bracing apparatus of claim 9, wherein the head clip comprises:
a first rectangular plate;
a second rectangular plate, with one edge abutting one edge of the first rectangular plate, the abutting plates forming a 90 degree angle and connected along the abutting edge, wherein the first and second plates each have a major interior surface and an exterior major surface and the angle formed by the interior major surfaces is 90 degrees and the angle formed by the exterior major surfaces is 270 degrees;
two first flanges formed from the first plate, each first

flange having an edge extending along a respective edge of the first plate that is perpendicular to the abutting edge of the first and second plates, the first flanges at 90 degree angles to the first plate exterior major surface and away from the interior major surface;

two second flanges formed from the second plate, each second flange having an edge extending along a respective edge of the second plate that is perpendicular to the abutting edge of the first and second plates, the second flanges at 90 degree angles to the second plate exterior major surface and away from the interior major surface; and

at least one bracket member plate having one edge fixedly attached to the interior major surface of the first plate and one edge fixedly attached to the interior major surface of the second plate.

[c12] 12.The bracing apparatus of claim 9, wherein the sill clip comprises:

a first rectangular plate;

a second rectangular plate, with one edge abutting one edge of the first rectangular plate, the abutting plates forming a 90 degree angle and connected along the abutting edge, wherein the first and second plates each have a major interior surface and an exterior major surface and the angle formed by the interior major surfaces

is 90 degrees and the angle formed by the exterior major surfaces is 270 degrees;

two first flanges formed from the first plate, each first flange having an edge extending along a respective edge of the first plate that is perpendicular to the abutting edge of the first and second plates, the first flanges at 90 degree angles to the first plate exterior major surface and away from the interior major surface;

two second flanges formed from the second plate, each second flange having an edge extending along a respective edge of the second plate that is perpendicular to the abutting edge of the first and second plates, the second flanges at 90 degree angles to the second plate exterior major surface and away from the interior major surface; and

at least one bracket member plate having one edge fixedly attached to the interior major surface of the first plate and one edge fixedly attached to the interior major surface of the second plate.

[c13] 13.The bracing apparatus of claim 9, wherein each bracket member plate has a hole therethrough and the tension strut has a hole at each end, the holes of the each bracket member plate in proximate alignment with the holes at each end of the tension strut, further comprising a fastener passing through the holes of each

bracket member plate and each end of the tension strut.

[c14] 14.The bracing apparatus of claim 9, further comprising a fastener passing through the sill clip and the sill to anchor the sill clip to the base.

[c15] 15.The bracing apparatus of claim 9, further comprising a stud support clip, the tension strut passing therethrough and partial length vertical studs each having one end disposed in the stud support clip respectively above and below the tension strut, and the opposite end of each partial length vertical studs respectively mounted to the horizontal plate and the sill.

[c16] 16.The bracing apparatus for use in resisting lateral forces, uplift forces, or both in structural framing, the structural framing made of light gauge steel members, wood, or both, the structural framing comprising first and second vertical studs in spaced parallel relation, each having an upper end and a lower end, a horizontal plate across the top of the two vertical studs and fastened to the upper end of each stud, and a sill disposed along a base and fastened to the studs at the lower end of the studs, the bracing apparatus comprising:
a head clip mounted to the horizontal plate and the upper portion of the first vertical stud and a sill clip mounted the sill and to the lower portion of the second

stud, the head and sill clips comprising:

a first rectangular plate;

a second rectangular plate, with one edge abutting one edge of the first rectangular plate, the abutting plates forming a 90 degree angle and connected along the abutting edge, wherein the first and second plates each have a major interior surface and an exterior major surface and the angle formed by the interior major surfaces is 90 degrees and the angle formed by the exterior major surfaces is 270 degrees;

two first flanges formed from the first plate, each first flange having an edge extending along a respective edge of the first plate that is perpendicular to the abutting edge of the first and second plates, the first flanges at 90 degree angles to the first plate exterior major surface and away from the interior major surface;

two second flanges formed from the second plate, each second flange having an edge extending along a respective edge of the second plate that is perpendicular to the abutting edge of the first and second plates, the second flanges at 90 degree angles to the second plate exterior major surface and away from the interior major surface; and

at least one bracket member plate having one edge fixedly attached to the interior major surface of the first plate and one edge fixedly attached to the interior major

surface of the second plate;
a tension strut of adjustable length, comprising two reciprocally mounted structural sections and means for fixing the length of the strut, whereby the length of the strut may vary according to the distance between the head clip and the sill clip; and
means for mounting the tension strut to the head clip and to the sill clip.

[c17] 17.A braced framing assembly for use in resisting lateral forces, uplift forces, or both in structural framing, with structural framing made of light gauge steel members, wood, or both, the assembly comprising:
first and second vertical studs in spaced parallel relation, each having an upper end and a lower end;
a horizontal plate across the top of the two vertical studs and fastened to the upper end of each stud;
a sill disposed along a base and fastened to the studs at the lower end of the studs;
a head clip mounted to the horizontal plate and the upper end of the first vertical stud;
a sill clip mounted the sill and to the lower end of the second stud;
a tension strut of adjustable length; and
means for mounting the tension strut to the head clip and to the sill clip.

[c18] 18.The braced framing assembly of claim 17, wherein the tension strut comprises two reciprocally mounted structural sections and means for fixing the length of the strut, whereby the length of the strut may vary according to the distance between the head clip and the sill clip.

[c19] 19.The braced framing assembly of claim 17, wherein the head clip comprises:
a first rectangular plate;
a second rectangular plate, with one edge abutting one edge of the first rectangular plate, the abutting plates forming a 90 degree angle and connected along the abutting edge, wherein the first and second plates each have a major interior surface and an exterior major surface and the angle formed by the interior major surfaces is 90 degrees and the angle formed by the exterior major surfaces is 270 degrees;
two first flanges formed from the first plate, each first flange having an edge extending along a respective edge of the first plate that is perpendicular to the abutting edge of the first and second plates, the first flanges at 90 degree angles to the first plate exterior major surface and away from the interior major surface;
two second flanges formed from the second plate, each second flange having an edge extending along a respective edge of the second plate that is perpendicular to the

abutting edge of the first and second plates, the second flanges at 90 degree angles to the second plate exterior major surface and away from the interior major surface; and

at least one bracket member plate having one edge fixedly attached to the interior major surface of the first plate and one edge fixedly attached to the interior major surface of the second plate.

[c20] 20.The braced framing assembly of claim 17, wherein the sill clip comprises:

a first rectangular plate;

a second rectangular plate, with one edge abutting one edge of the first rectangular plate, the abutting plates forming a 90 degree angle, and connected along the abutting edge wherein the first and second plates each have a major interior surface and an exterior major surface and the angle formed by the interior major surfaces is 90 degrees and the angle formed by the exterior major surfaces is 270 degrees;

two first flanges formed from the first plate, each first flange having an edge extending along a respective edge of the first plate that is perpendicular to the abutting edge of the first and second plates, the first flanges at 90 degree angles to the first plate exterior major surface and away from the interior major surface;

two second flanges formed from the second plate, each second flange having an edge extending along a respective edge of the second plate that is perpendicular to the abutting edge of the first and second plates, the second flanges at 90 degree angles to the second plate exterior major surface and away from the interior major surface; and

at least one bracket member plate having one edge fixedly attached to the interior major surface of the first plate and one edge fixedly attached to the interior major surface of the second plate.

[c21] 21.The braced framing assembly of claim 17, wherein each bracket member plate has a hole therethrough and the tension strut has a hole at each end, the holes of the each bracket member plate in proximate alignment with the holes at each end of the tension strut, further comprising a fastener passing through the holes of each bracket member plate and each end of the tension strut.

[c22] 22.The braced framing assembly of claim 17, further comprising a fastener passing through the sill clip and the sill to anchor the sill clip to the base.

[c23] 23.The braced framing assembly of claim 17, further comprising a stud support clip, the tension strut passing therethrough and partial length vertical studs each hav-

ing one end disposed in the stud support clip respectively above and below the tension strut, and the opposite end of each partial length vertical studs respectively mounted to the horizontal plate and the sill.

[c24] 24.A braced framing assembly made of light gauge steel members, wood, or both, the framing assembly comprising:

first and second vertical studs in spaced parallel relation, each having an upper end and a lower end;

a horizontal plate across the top of the two vertical studs and fastened to the upper end of each stud;

a sill disposed along a base, and fastened to the studs at the lower end of the studs;

a head clip mounted to the horizontal plate and the upper end of the first vertical stud and a sill clip mounted the sill and to the lower portion of the second stud, the head and sill clips comprising:

a first rectangular plate;

a second rectangular plate, with one edge abutting one edge of the first rectangular plate, the abutting plates forming a 90 degree angle and connected along the abutting edge, wherein the first and second plates each have a major interior surface and an exterior major surface and the angle formed by the interior major surfaces is 90 degrees and the angle formed by the exterior ma-

jor surfaces is 270 degrees;

two first flanges formed from the first plate, each first flange having an edge extending along a respective edge of the first plate that is perpendicular to the abutting edge of the first and second plates, the first flanges at 90 degree angles to the first plate exterior major surface and away from the interior major surface;

two second flanges formed from the second plate, each second flange having an edge extending along a respective edge of the second plate that is perpendicular to the abutting edge of the first and second plates, the second flanges at 90 degree angles to the second plate exterior major surface and away from the interior major surface; and

at least one bracket member plate having one edge fixedly attached to the interior major surface of the first plate and one edge fixedly attached to the interior major surface of the second plate;

a tension strut of adjustable length, comprising two reciprocally mounted structural sections and means for fixing the length of the strut, whereby the length of the strut may vary according to the distance between the head clip and the sill clip; and

means for mounting the tension strut to the head clip and to the sill clip.

[c25] 25.A method of making a bracing clip for use in resisting lateral forces, uplift forces, or both in light gauge steel members or wood structural framing members, the method comprising:
providing a rectangular plate having side edges and front and rear edges;
identifying a first breakpoint line at approximately the midpoint of the rectangular plate, from side edge to side edge, and parallel to the front and rear edges;
sheering the plate along the breakpoint line an equal distance from each side edge of the plate until the remaining dimension of unsheered material along the first breakpoint line is approximately equal to the dimension of the framing member;
identifying two second breakpoint lines parallel to each side edge of the plate, passing through the point that is the extent of the sheering;
breaking the plate along the second breakpoint lines to make four flanges all oriented in the same direction at approximately 90 degrees to the rectangular plate; and
breaking the plate along the first breakpoint line to define first and second rectangular portions formed at an angle of approximately 90 degrees, with the flanges outward from the 90 degree angle formed around the first breakpoint.

[c26] 26.The method of making a bracing clip of claim 25, further comprising punching holes while the plate is flat.

[c27] 27.The method of making a bracing clip of claim 25, further comprising welding bracket plate members to the first and second rectangular portions across the 90 degree angle.

[c28] 28.A method of bracing structural framing for use in resisting lateral forces, uplift forces, or both, the structural framing made of light gauge steel members, wood, or both, and comprising first and second vertical studs in spaced parallel relation, each having an upper end and a lower end, a horizontal plate across the top of the two vertical studs and fastened to the upper end of each stud, and a sill disposed along a base and fastened to the studs at the lower end of the studs, the method comprising:

mounting a head clip to the horizontal plate and the upper end of the first vertical stud;

mounting a sill clip to the sill and the lower portion of the second stud;

providing a tension strut of adjustable length with reciprocally mounted sections;

adjusting the length of the tension strut;

mounting the tension strut to the head clip and to the sill clip; and

fixing the length of the tension strut.